What is claimed is:

1. A pressure vessel having an inner surface and an outer surface with a plurality of penetrations defined by penetration walls extending between the inner surface and the outer surface, and a plurality of penetration nozzles extending in the penetration holes and sealed with the pressure vessel by circumferential structural welds at the inner surface, wherein each penetration wall and adjacent penetration nozzle defines a passageway extending therebetween from the circumferential structural weld to the outer surface and wherein each passageway comprises a groove in the penetration wall or the penetration nozzle for providing a leak path from the weld to the outer surface.

2. The pressure vessel of Claim 1, wherein each penetration nozzle has an axis and each groove extends axially along the penetration nozzle.

3. The pressure vessel of Claim 2, wherein a plurality of grooves axially extend in parallel along the penetration nozzle.

4. The pressure vessel of Claim 1, wherein each penetration nozzle has an axis and each groove spirally extends around the axis.

5. The pressure vessel of Claim 1, wherein each passageway has an inner end defined by a counterbore.

6. The pressure vessel of Claim 1, wherein each passageway has an outer end defined by a counterbore.

7. The pressure vessel of Claim 1, wherein each passageway has an inner end and an outer end defined by counterbores.

8. The pressure vessel of Claim 1, wherein the penetration nozzles extend through a hemispherical pressure vessel head.

9. The pressure vessel of Claim 1, wherein the penetration nozzles extend through a pressure vessel containing radioactive fuel assemblies.